

h. Proctor
[Extracted from the LINNEAN SOCIETY'S JOURNAL—BOTANY,
vol. xxxviii. February 1909.]

*To Mr J. Hedham
with Complts
from W.N.C. & T.G.*

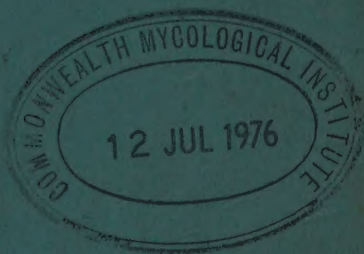
A CONTRIBUTION TO THE MYCOLOGY OF
SOUTH AFRICA.

BY

W. N. CHEESMAN, F.L.S.

WITH A NOTE ON THE COPROPHILOUS FUNGI,

BY THOMAS GIBBS.



A Contribution to the Mycology of South Africa. By W. N. CHEESMAN,
F.L.S. With a Note on the Coprophilous Fungi, by THOMAS GIBBS.

(PLATE 36.)

[Read 4th June, 1908.]

THE time of the visit to South Africa by the British Association during the autumn of 1905 was very enjoyable from the traveller's point of view, but not the most profitable from a botanical standpoint. In Central Africa the seasons are simply two—the wet and the dry. The rainy season or summer extends from October to April, and the dry season or winter (during which scarcely any rain falls) from May to September. It was at the end of the latter period when the visit was made, and the dry and parched appearance of the vegetation contrasted very strongly with the hearty welcome and cordial hospitality extended by the colonists to their guests. In winter the thermometer would register 90° F. at mid-day, falling to 40° at night.

Notes on Distribution.

The present contribution adds 25 species to the Mycologic flora of Africa, one of which is new to science.

This addition tends to prove what has for some time been suspected, that the numerous large and typical genera are cosmopolitan, with specialized forms—so-called species—characteristic of each region.

Among such may be enumerated *Poria vaporaria*, *Polyporus elegans*, *Schizophyllum commune*, and *Polystictus sanguineus*. Some of these, like the last-named, are most abundant in tropical regions, with but few outliers in temperate regions. Others, as *Poria vaporaria* and *Polyporus gilvus*, have their headquarters in temperate regions. An examination of the list reveals the fact that various species more or less common in the New World, Europe, and Australasia respectively are now added to the African list.

Excluding the Myxogastres, it will be observed that of the 30 species of the larger fungi 10 are cosmopolitan, whilst the remaining 20 are here recorded for the first time from the African continent; and again, 12 of the 30 are found in Australasia, two, viz. *Polyporus nanus* and *Hexagonia decipiens*, being hitherto recorded only from that quarter of the globe. This fact may be another indication of the supposed ancient land-connection

between South Africa and Australasia, a theory which is suggested so strongly in many of the Phanerogams of South Africa*.

The writer wishes to acknowledge his indebtedness to Mr. Geo. Massee for determining many of the species, and for his kind help and suggestions.

List of Fungi collected at the Victoria Falls and other places in South Africa in August and September 1905.

GASTROMYCETÆ.

NIDULARIACEÆ.

CYATHUS STERCOREUS, *De Toni*.

Victoria Falls : Livingstone Island.

Distrib. America, Australasia.

LYCOPERDACEÆ.

GEASTER LIMBATUS, *Fr.*

Victoria Falls : Palm Kloof.

Distrib. Europe, Africa, America.

LYCOPERDON LILACINUM, *Berk.*

Victoria Falls : edge of Rain Forest.

Distrib. Asia, Africa, America, Australasia.

HYMENOMYCETÆ.

AGARICACEÆ.

LEPIOTA sp.

Matoppo Hills, shaded place on the edge of a stream.

COLLYBIA sp.

Groot Schuur near Cape Town.

MYCENA sp.

Groot Schuur near Cape Town.

VOLVARIA sp.

Victoria Falls : East Ferry, on a fallen branch of a Baobab-tree.

* The Natal Coal-bearing rocks of Permo-Carboniferous age produce some six or eight species of the fossil plant *Glossopteris*, which are also abundant in the Coal-beds of the same age in Australia.

SCHIZOPHYLLUM COMMUNE, *Fr.*

On mine-props, 2000 feet deep, in Langlaagte Gold Mine, Johannesburg, and in the deep workings of the Wesselton Diamond Mine, Kimberley.

Distrib. Cosmopolitan.

POLYPORACEÆ.

TRAMETES HYDNOIDES, *Sw.*

Victoria Falls : thickly imbricate, on a fallen *Ficus*-log, East Ferry.

Distrib. Africa, America.

PORIA CITRINA, *Massee.*

Victoria Falls : Rain Forest.

Distrib. Asia.

PORIA VAPORARIA, *Fr.*

Groot Schuur near Cape Town.

Distrib. Cosmopolitan.

POLYSTICTUS SANGUINEUS, *Fr.*

Victoria Falls : Palm Kloof and Rain Forest.

Distrib. Asia, Africa, America, Australia.

FOMES SENEX, *Nees.*

On Livingstone Island fine specimens occurred on several fallen logs and also on the dead trunk of the tree bearing the initials of David Livingstone, which is now fenced round.

Distrib. Asia, America.

FOMES HEMILEUCUS, *Berk.*

Victoria Falls, near Leaping Cascade.

Distrib. America.

POLYPORUS NANUS, *Massee.*

Victoria Falls : Rain Forest.

Distrib. Australasia.

POLYPORUS ELEGANS, *Fr.*

Victoria Falls ; Matoppo Hills ; Cape Town.

Distrib. Europe, America, Australasia.

POLYPORUS GILVUS, *Schwein.*

Victoria Falls : Rain Forest.

Distrib. Europe, America.

POLYPORUS CRISTATUS, *Fr.*

Victoria Falls ; Park Town, Johannesburg.

Distrib. Europe, America.

POLYPORUS OCHROLEUCUS, *Fr.*

Matoppo Hills.

Distrib. Asia, Australasia.

POLYPORUS ECKLONI, *Henn.*

Victoria Falls : Rain Forest.

Distrib. Africa.

POLYPORUS VARIUS, *Fr.*

Victoria Falls : Rain Forest.

Distrib. Europe, Asia, America.

HEXAGONIA DECIPIENS, *Berk.*

Victoria Falls : on fallen branches, on the edge of the Rain Forest.

Distrib. Australasia.

HEXAGONIA POLYGRAMMA, *Fr.*

Victoria Falls : on a fallen tree, near East Ferry.

Distrib. Asia, Africa, America.

STROBILOMYCES STROBILACEUS, *Berk.*

Victoria Falls : edge of Rain Forest.

Distrib. Europe, America.

THELEPHORACEÆ.

STEREUM LOBATUM, *Fr.*

Groot Schuur near Cape Town ; East London.

Distrib. Asia, Africa, America, Australasia.

HYMENOCHÆTE TABACINA, *Lév.*

Groot Schuur near Cape Town.

Distrib. Cosmopolitan.

HYMENOCHÆTE TENUISSIMA, *Berk.*

Victoria Falls : Livingstone Island.

Distrib. Asia, America, Australasia.

CYPHELLA CHEESMANI, *Massee*, sp. nov.

Victoria Falls : Rain Forest.

Membranacea, sessilis, cupularis, demum explanata, extus villosa, nivea, 1 mm. diam.; hymenio leniter plicato. Basidia clavata, apice 4-sterigmatica ; sporis ovoideis, tenuiter asperulis, hyalinis, $12-15 \times 7-8 \mu$.

Hab. in ramis decorticatis.

TREMELLACEÆ.

HIRNEOLA AURIFORMIS, *Fr.*

Victoria Falls : north bank of the Zambesi River.

Distrib. America, Australasia.

GUEPINIA FLABELLATA, *Fr.*

Victoria Falls : west side near Leaping Cascade.

Distrib. Asia.

CALOCERA CORNEA, *Fr.*

Victoria Falls : Rain Forest.

Distrib. Europe, America, Australasia.

PYRENOMYCETÆ.

HYPOXYLON COLLICULOSUM, *Nitschke.*

Victoria Falls : Palm Kloof.

Distrib. America.

HYPOXYLON ANNULATUM, *Fr.*

Victoria Falls : Livingstone Island.

Distrib. America, Australasia.

ROSELLINIA AQUILA, *De Not.* (*Byssosphæria*, Cooke.)

Ladysmith, Natal ; on decaying wood, Klip River.

Distrib. Europe, Asia, America.

MYXOGASTRES.

STEMONITES FUSCA, *Rost.*

Pietermaritzburg, Natal.

Distrib. Europe, Asia, America, Australasia.

STEMONITES FRIESIANA, *De Bary.*

Bloemfontein, near Sannah's Post, O.R.C.

Distrib. Europe, America.

ARCYRIA SERPULA, *Massee.*

Victoria Falls : Rain Forest. East London.

Distrib. Europe, Asia, America, Australasia.

CHONDRIODERMA DIFFORME, *Rost.*

Victoria Falls : Rain Forest. Umtali, East Rhodesia.

Distrib. Europe, Asia, Africa, America.

DIACHÆA LEUCOPODA, *Rost.*

Victoria Falls : Rain Forest. Mombasa, B.E. Africa.

Distrib. Europe, Asia, Africa, America.

TILMADOCHÉ NUTANS, *Rost.*

Victoria Falls : Palm Kloof. Umkomaas, near Durban.

Distrib. Europe, America, Australasia.

BADHAMIA VARIA, *Massee.*

Port Elizabeth, on decaying wood ; East London, bright orange-yellow plasmodium on *Stereum*.

Distrib. Europe, America.

BIBLIOGRAPHY.

(From Cooke's 'Introduction to the Study of Fungi,' p. 341, 1895.)

South Africa, Natal, Cape Colony, &c.

FRIES, E.—*Fungi Natalenses*. 8vo. Stockholm, 1848.

COOKE, M. C.—"Fungi of Natal," in *Grevillea*, viii. 1880 ; ix. 1880 ; x. 1881.

— "African Fungi," in *Grevillea*, xix. 1890.

KALCHBRENNER, C.—"Fungi Macowaniani," in *Grevillea*, ix. 1880–81 ; xi. 1882.

KALCHBRENNER, C., and M. C. COOKE.—"South African Fungi," in *Grevillea*, ix. 1880–81.

FAYOD, V., in SCHINZ, H. : "Beiträge zur Kenntniss der Flora von Deutsch-Südwest-Afrika." *Abhand. Bot. Vereins f. Brandenburg*, xxxi. (1890) 224–229, t. 3.

BERKELEY, M. J.—"Fungi, collected by Zeyher in Uitenhage," in *Hook. Lond. Journ. Bot.* ii. (1843) 507–524, t. 21 [number xxii].

— "Decades of Fungi," No. 1, in *Hook. Lond. Journ. Bot.* iii. (1844) 185–194, t. 5, 6.

MONTAGNE, C.—"Enumeratio Fungorum quos à M. Drège in Africa Meridionali collectos . . illustravit C. M." in *Ann. Sci. Nat. (Bot.) sér. III.* vii. (1847) 163–178.

NOTE ON THE COPROPHILOUS FUNGI.

(By THOMAS GIBBS.)

FOUR samples of the dung of wild animals gathered by Mr. Cheesman during his South African tour were entrusted to the writer for laboratory examination. Of the material sent one sample was that of the Hippopotamus, and gathered on Livingstone Island, Victoria Falls. The others were from the Matoppo Hills ; the kind of animal to which they belonged was not ascertained, a circumstance not, however, of much importance for, as Massee

and Salmon * remark, coprophilous Fungi seem generally to be quite indifferent as to their particular hosts. One sample, however, was in small round pellets similar to rabbit-dung, the other two being of larger animals, all apparently belonging to herbivorous mammals.

The material was received by the writer in November 1905, and was treated as recommended by Massee and Salmon *, being kept under glass covers upon wet blotting-paper. The water used was sterilized by boiling to prevent infection by spores from outside sources. Notwithstanding their subtropical origin, the cultivations were carried on through a Derbyshire winter and spring in a room without a fire, but in a window warmed by the morning sun.

The first appearance of a fungus-growth was noticed soon after Christmas, when the round pellets mentioned above (which had for a few days been placed in a warm room) appeared as if sprinkled with soot owing to a profuse growth of *Saccobolus depauperatus*, Rehm. From this time for upwards of three months, indeed so long as the material was kept moist, the fungus crop continued, and fresh species appeared from time to time.

Altogether thirteen species were seen: of these, eight were of known species; one (*Coprinus Cheesmani*, Gibbs) is now described for the first time; of two others, (6) *Sordaria* sp. and (8) *Delitschia* sp., the portions seen were too fragmentary for certain recognition; while of two more, (2) *Coprinus* sp. and (13) *Ascophanus* sp., which could not be identified with any known species, the scanty material seen did not justify new specific diagnoses.

A full bibliography of the whole subject will be found in Messrs. Massee and Salmon's paper in the Oxford 'Annals of Botany,' xv. (1901) 353-355.

List of Fungi observed.

HYMENOMYCETÆ.

AGARICACEÆ.

1. COPRINUS CHEESMANI, Gibbs (sp. nov.). (Plate 36.)

Livingstone Island, Victoria Falls.

C. pileo tenerrimo, aliquandiu ovato-campanulato, tunc expanso, umbonato, posthac sursum curvato, plicato-sulcato, tandem ad partem dorsalem lamellarum fisso, latitudine ad 23 mm., pallido-fulvo vel subrufo, disco obscuriore tandem depresso, pilis erectis hyalinis non septatis vestito. Lamellæ griseo-nigrantes adnatæ vel adnexæ angustæ, 50-70 numero in pileis majoribus.

* Massee, G., and Salmon, E. S., "Researches on Coprophilous Fungi," Annals of Botany, xv. 313-357, pls. 17, 18 (1901).

Stipes ad $4\frac{1}{2}$ cm. longitudine, circiter 1 mm. crassitudine, fistulosus, flaccidus, hyalinus, in parte inferiore dense pilosus, prope apicem glaber. Sporæ fusco-purpureæ, ellipticæ, polis obtusis, $12-16 \times 6-8 \mu$.

Hab. in fimo Hippopotami.

This fungus appears to be closely allied to the well-known *Coprinus radiatus*, Fr., but is much larger in all its parts. The spore measurements given above cover what appears to be the normal range, but individual spores were seen 20μ in length.

2. *COPRINUS* sp.

Matoppo Hills.

Two specimens occurred of a very minute spec.es. Pileus 1-2 mm., pallid, with rust-coloured scurfy patches. Stem $\frac{1}{2}$ -1 cm. high, slightly hairy; spores elliptical, $11-15 \times 6-9 \mu$. The material was not, however, sufficient for identification with any known species nor for a new specific diagnosis.

PYRENOMYCETÆ.

3. *SORDARIA CURVULA*, *De Bary*.

Matoppo Hills.

Distrib. Europe, North America.

4. *SORDARIA PLEIOSPORA*, *Wint.*

Matoppo Hills.

Distrib. Europe.

5. *SORDARIA PLATYSPORA*, *Plowr.*

Matoppo Hills.

Distrib. Britain.

6. *SORDARIA* sp.

A fungus allied to, but in some respects differing from, *S. anserina*, Wint.; it occurred on Hippopotamus-dung gathered on Livingstone Island, Victoria Falls.

7. *DELITSCHIA BISPORULA*, *Hans.*

Matoppo Hills.

Distrib. Europe.

8. *DELITSCHIA* sp.

Matoppo Hills.

Fragments, including large chestnut-brown spores, $45 \times 15 \mu$, occurred on the dung of a large animal.

9. *SPORORMIA INTERMEDIA*, *Auersw.*

Matoppo Hills.

Distrib. Europe, North and South America.10. *SPORORMIA AMBIGUA*, *Niessl.*

Matoppo Hills.

Distrib. Europe, South America.11. *SPORORMIA PASCUA*, *Niessl.*

Matoppo Hills.

Distrib. Europe.

DISCOMYCETÆ.

12. *SACCOBOLUS DEPAUPERATUS*, *Rehm.*

Matoppo Hills.

Distrib. Europe, North America.

Two forms occurred, a larger and a smaller, but both probably belonged to this species. The larger (ascophores $\frac{1}{4}$ – $\frac{1}{2}$ mm. across, spores $13\text{--}16 \times 6\text{--}7 \mu$) was so abundant on the small pellets like rabbit-dung that it appeared as if sprinkled with soot. The smaller form (ascophores up to $\frac{1}{4}$ mm., spores $10\text{--}12 \times 6\text{--}6\frac{1}{2}$) appeared on one of the other samples and was much less abundant.

13. *ASCOPHANUS* sp.

Matoppo Hills.

A few ascophores occurred of a minute brick-red *Ascophanus*, which Miss A. Lorrain Smith considered nearest to though not identical with *A. granuliformis*, Boud. The material, however, was not sufficient to justify a new specific diagnosis.

A noticeable feature in the above list is the predominance of the Pyrenomycete family Sordariæ, 9 of the 13 species observed belonging to that family, a much larger proportion than is usual in a like gathering in England, where the leading place is more usually taken by the Ascobolæ. The total absence of Hyphomycetæ and Mucoraceæ is also remarkable, and is perhaps explained by the prolonged desiccation the material had undergone, the conidia of these families being probably less able to withstand such conditions than are the spores of the more highly organised Basidiomycetæ and Ascomycetæ.

It will also be noticed as an interesting fact that eight of the thirteen species seen belong to known European species: this confirms the opinion

expressed by Massee and Salmon (*supra*) as to the wide distribution of individual species of coprophilous fungi.

It only remains for the writer to acknowledge his indebtedness to Miss A. Lorrain Smith for much assistance in determining species, and to Mr. G. Massee for assistance in the genus *Coprinus*.

EXPLANATION OF PLATE 36.

- Fig. 1. *Coprinus Cheesmani*, Gibbs. Group of plants, nat. size.
 - Fig. 2. Plants marked "a" and "b" in fig. 1, $\times 3$.
 - Fig. 3. Section slightly magnified.
 - Fig. 4. Cells of epidermis and hairs, $\times 200$.
 - Fig. 5. Spores, $\times 400$.
-



T. Gibbs del.
J. N. Fitch lith.

West, Newman imp.

COPRINUS CHEESMANI, Gibbs.

